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Goddard Space Flight Center

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Solar-Powered Helios Aims For Record Altitude

The sky is black 100,000 feet above ground, and you can clearly see the curvature of the Earth. The air is so thin it is incapable of supporting life. It is also incapable of supporting sustained horizontal flight of an aircraft-until now.

It is into that hostile environment 19 miles above ground that a small group of engineers from NASA's Dryden Flight Research Center and AeroVironment, Inc., Monrovia, CA, plan to fly the unique unmanned solar-powered Helios Prototype.



NASA Photo by: Nick Galante/PMRF

The Helios Prototype flying wing is shown over the Pacific Ocean during its first test flight.

The giant yet ultralight flying wing could soar into the stratosphere on its quest as early as the second week in August, after successfully completing an 18-hour functional checkout flight on July 15. The flights are being conducted from the U.S. Navy's Pacific Missile Range Facility on the Hawaiian island of Kauai.

Should the Helios Prototype reach its objective, it would set a new world's altitude record for propeller-driven aircraft, surpassing the 80,201-foot record of its predecessor, the solar-electric Pathfinder-Plus, set in August, 1998. It would also exceed the highest reported altitude achieved in sustained horizontal flight by jet-powered aircraft as well, 85,068 feet by a SR-71 aircraft in July, 1976. Only short-duration rocket-powered aircraft have flown higher.

The Helios Prototype is one of the unique remotely operated, uninhabited aerial vehicles (UAV) being developed for high-altitude, long-duration earth science imaging and atmospheric sampling missions under the Environmental Research Aircraft and Sensor Technology (ERAST) project at Dryden.

John Del Frate, project manager for solar-powered aircraft at Dryden, noted

that setting an altitude record is only one of several goals for this summer's flight tests. "A 100,000-foot altitude record would be the icing on the cake," he said. "Our primary interest in testing this new aircraft is for taking sophisticated lightweight science instruments to greater heights."

"Another added bonus for NASA is the fact that flight at 100,000 feet would be very similar to flight in the Martian atmosphere," Del Frate added. "In a way, we are going to school on these flights to learn what the aerodynamics are like in these conditions."

AeroVironment vice-president Robert Curtin noted that production versions of the Helios could also serve as long-endurance commercial telecommunications relay platforms, orbiting over major population centers at 55,000 to 70,000 feet altitude for months at a time. Disaster recovery agencies might one day be able to move a Helios over the scene of a catastrophe where the normal communications infrastructure has been destroyed. "AeroVironment's goal is to develop an airplane that is the equivalent of an 11-mile-high tower in the sky," he added.

The primary objective of Helios' recent checkout flight was to expand the flight envelope of the aircraft and verify proper operation of aircraft systems at high altitudes. Reaching an altitude of 76,271 feet was considered necessary in order to reduce risk for the upcoming effort to achieve sustained horizontal flight at 100,000 feet altitude.

The 247-foot-span ultralight flying wing flew six low-altitude initial airworthiness validation flights on battery power at NASA Dryden in the fall of 1999. Since then, the Helios Prototype has undergone major upgrades, including the installation of approximately 65,000 high-efficiency solar cells across the wing, which can produce more than 35 kilowatts of electricity.

The 100,000-foot altitude flight is one of two major flight milestones set for the craft by NASA, the other being a four-day non-stop long-endurance demonstration flight above 50,000 feet planned for 2003.

GOES-M Environmental Spacecraft Successfully Launched

An advanced environmental satellite equipped with instruments to monitor Earth's weather and a telescope that will be used to detect solar storms was successfully launched July 23 at 3:01 a.m. from Cape Canaveral Air Force Station, Fla.

The satellite, GOES-M, will monitor hurricanes, severe thunderstorms, flash floods and other severe weather. It is the first of the GOES satellites equipped with a Solar X-ray Imager which will be used to forecast earth space weather due to solar activity.

NOAA's Geostationary Operational Environmental Satellite (GOES)-M spacecraft was carried into space aboard a Lockheed Martin Atlas IIA rocket. Twenty-seven minutes later, the spacecraft separated from the Centaur stage. At approximately 4:40 a.m., controllers successfully deployed the outer panel of the solar array, making the spacecraft power positive.

"We're off to a great start," said Martin Davis, GOES project manager at NASA's Goddard Space Flight Center. "The spacecraft is now in transfer orbit and all data indicates we have a healthy spacecraft."

The spacecraft is a three-axis internally stabilized weather spacecraft that has the dual capability of providing pictures while performing atmospheric sounding at the same time. Once in geostationary orbit, the spacecraft is to be designated GOES-12.

Throughout the next 17 days, NASA and the National Oceanic and Atmospheric Administration (NOAA) controllers are scheduled to perform several apogee motor firings and adjust maneuvers, culminating with the spacecraft arriving in a geosynchronous orbit 22,240 miles (35,790 kilometers) above the Earth's equator at 90 degrees West Longitude. Controllers will operate the spacecraft from the NOAA's Satellite Operations Control Center in Suitland, Md.

GOES-M was built and launched for NOAA under technical guidance and project management by the NASA Goddard Space Flight Center. GOES information and imagery are available on the World Wide Web at:
<http://www.goes.noaa.gov>
<http://goes2.gsfc.nasa.gov>
<http://rsd.gsfc.nasa.gov/goes/>

Wallops Shorts.....

Balloon Launch

A NASA scientific balloon was successfully launched from Palestine, Texas on July 18. The 11.82 million cubic foot balloon carried an upper atmosphere research experiment. Dr. Herb Pickett, Jet Propulsion Laboratory was the principal investigator. Total flight time was 6 hours, 41 minutes.

NASA STARS

NASA Goddard Space Flight Center will implement the Agency’s new **STaffing And Recruitment System**, (NASA STARS) beginning July 23.

NASA STARS is a new resume management process. Goddard is the lead Center for this Integrated Financial Management Program Pathfinder project.

This new hiring process will be much easier. There will be no more long forms (SF171’s and OF612’s) and supplemental forms. Applicants will no longer need to address Knowledges, Skills, and Abilities (KSA’s) when applying for a NASA position. Instead, they will use a single resume created in an automated Resume Builder.

Any applicant using the Resume Builder will submit a resume electronically. Those applicants who submit a paper resume must ensure that it complies with the NASA STARS Resume Guide. They resume must be mailed to the Resume Operations Center (ROC) at the Marshall Space Flight Center (MSFC) to be scanned into the system. Paper resumes must be received by the ROC by the closing date of the vacancy announcement. Faxed copies of resumes will not be accepted. Goddard’s Office of Human Resources will not accept paper resumes for vacancies advertised through NASA STARS.

Applicants should pay particular attention to the “How to Apply” section on vacancy announcements. These instructions will clearly indicate the process to follow.

Employees are encouraged to begin building resumes using the Resume Builder (resume.nasa.gov). Once a resume has been built, the applicant can use the “Quick Apply” feature to apply for jobs at Goddard. The Resume Builder has an online Guide to assist in preparing resumes. Employee briefings and workshops will be held throughout July and August.

NASA STARS has many features for employees, hiring managers and Human Resources Management Specialists. Visit nasastars.nasa.gov for general information on NASA STARS. Visit the OHR website at ohr.gsfc.nasa.gov for information on Employee Briefings and Resume Building Workshops. For additional information call Ann Richmond, x66-7571.

Championship Boxing
Roy Jones vs Julio Gonzalez
Light Heavyweight Title
July 28
9 p.m.
On the Big Screen
Building E-2

Saffir-Simpson Hurricane Scale

Category 1
Winds: 74-95 mph
Damage to mainly trees, shrubbery, unanchored mobile homes and boats

Category 2
Winds: 96-110 mph
Considerable damage to trees, some roofs, windows, doors, and entire marinas. Minor damage to buildings.

Category 3
Winds: 111-130 mph
Expect some structural damage inland, damage to small buildings on the coast and destruction of large trees.

Category 4
Winds: 131-155 mph
Expect extensive structural and roof damage inland and major damage to lower floors and buildings near the coast.

Category 5
Winds: Above 155 mph
Expect destruction of many roofs, residences and industries. Many small buildings will be blown over or away.

Sympathy is extended to the family and friends of Earl Thomas Dix who died July 10 in Shore Memorial Hospital. Dix retired as a foreman in the NASA Riger Shop.

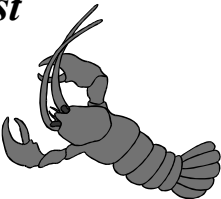
Lunch ‘N Learn
July 26, 2001
11 a.m. to Noon
Williamsburg Room (Building E-2)

Enjoy your lunch while Trooper Buchanan of the Virginia State Police shares important safety information, including:
Safe Driving Tips
Proper use of vehicle safety restraints
Proper use of infant and child safety seats

There will also be an informative video presentation, handouts and a question and answer session (time permitting).

Lobster Fest

August 10, 2001
6 p.m.
Building F-3



\$15 per person

Menu:
Salad, Lobster, Corn-on-the-Cob
Baked Potato, Hush Puppies
Dessert and Beverage

Tickets available at the Exchange, Building E-2 (x2020) or at the Rocket Club, Building F-3 (x1454)

Upcoming Training

Mishap Investigation Board Chairman

Wallops Flight Facility
Building E-2
August 16 - 17
8 a.m. to 4 p.m.

Additional information and course registration forms can be found at <http://www.wff.nasa.gov/~code803/pages/training.html>

Advanced Microsoft Project 2000

Wallops Flight Facility
Building E-104, Room 308
September 6
8:30 a.m. to 4 p.m.
To enroll, contact Tracey White, x66-5378.

Prescription Safety Eyeglasses

The Chesapeake Optical Van will be at Wallops on Wednesday, July 25, to dispense prescription safety eyeglasses. The van will be in the parking lot near the Cafeteria (behind Bldg. E-2) from 10 a.m. to 1 p.m.

All interested parties need to obtain a “Request for Prescription Safety Eyeglass Form” from the Health Unit. The completed form and an up-to-date eye-glass prescription are required for your order to be processed. Call the Health Unit at x1266 with any questions.

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<http://www.wff.nasa.gov>